REMARKS

Favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Claims 1-10 are rejected under 35 USC 102 as anticipated by or, in the alternative, under 35 USC 103 as obvious over WO 97/38236 or U.S. Patent No. 6,524,681, both to Seitz et al. This ground of rejection has been interpreted as being a rejection of all pending claims 1-12. The rejection is respectfully traversed as applied to the amended claims.

Claim 1 has been amended by incorporating the subject matter of claims 2 and 4 into claim 1.

Claims 2, 3 and 4 have been cancelled.

In claims 11 and 12, the phrases "or (D) a foundry coke with an ash content of 5 mass% to 8 mass" and "or the foundry coke" have been deleted.

Claims 13-15 are added for additional patent protection.

Re: Rejections under 35 USC 102 over Seitz et al.

Enclosed is a Table (Appendix B) which shows a comparison of the claimed invention with the cited references to Seitz et al.

Amended Claim 1 has the following limitations:

(a) a calcined petroleum coke;

(b) a content of the calcined petroleum coke is 30 mass% to 80 mass%, based on the whole friction materials;

(c) an ash content of the calcined petroleum coke is 0.1 mass% to 1 mass%; and

(d) not less than 50 mass% of the particles of the calcined petroleum coke have a particle diameter of 0.1 to 0.5 mm.

On the other hand, Seitz et al. discloses on column 3, lines 5-12 that "the friction material includes friction particles selected from the group of an organic material, --- , more preferably, the friction particles comprise an organic material, even more preferably, the organic material comprises coke, wherein the coke is selected from the group consisting of --- , a petroleum coke, - - -". However, Seitz et al. does not specifically disclose a calcined petroleum coke. Further, Seitz et al. is silent with respect to the specific combination of limitations (a)-(d).

Thus, the friction material of amended claim 1 is not disclosed in Seitz et al. Therefore, the invention of amended claim 1 has novelty over Seitz et al.

Claims 6-10 are dependent upon amended claim 1. Since claim 1 has novelty over Seitz et al., the invention of claims 6-10 has novelty over Seitz et al. as well.

Amended claims 11 and 12 further have the following limitations:

(e) 10 mass% to 30 mass% of a thermosetting resin;

(f) 5 mass% to 40 mass% of inorganic fibers and/or inorganic particles; and

(g) not more than 5 mass% of graphite,

in addition to amended claim 1. Thus, claims 11 and 12 fall within the scope of claim 1. Since the invention of claim 1 has novelty over Seitz et al., the invention of claims 11 and 12 have novelty over Seitz et al. as well.

Re: Rejections under 35 USC 103 over Seitz et al.

Unobviousness of limitations

The limitations (a)-(d) as mentioned above cannot be conceived from Seitz et al. (please see Appendix B). Further, the specific combination of limitations (a)-(d) is neither disclosed nor suggested in Seitz et al. Thus, limitations (a)-(d) and the specific combination thereof are unobvious from Seitz et al. to those skilled in the art.

Unexpected results by the specific combination of limitations

A synchronizer ring comprising the friction material of amended claim 1 achieves a significantly excellent effect of improving synchronization performance by specifically combining limitations (a)-(d) of claim 1. To prove this significantly excellent effect of the present invention, the Applicants submit a Rule 1.132 Declaration herewith. The Rule 1.132 Declaration is duly executed by Mr. Tomoya TAKATA, who is one of the present inventors. The significantly excellent effect of the claimed friction material is clearly shown in Experiments 1 and 2 described in the Rule 1.132 Declaration.

In Experiment 1, the effect of coke material and ash content on synchronization performance was studied. The results of Experiment 1 are shown in Table 1 enclosed (Appendix C), which is the same as Table 1 of the Rule 1.132 Declaration.

As shown in Table 1, the average coefficient of dynamic friction of Sample 1 (inventive product) is 0.006-0.018 higher than those of Samples 2-5 (comparative products). Generally, a synchronization performance of a synchronizer ring significantly improves by increasing an

average coefficient of dynamic friction of the friction material by at least 0.005. Thus, Sample 1 achieves a significantly excellent synchronization performance in comparison with Samples 2-5.

It is clear from these results that a friction material comprising 30 mass% to 80 mass% of a calcined petroleum coke with an ash content of 0 .1 mass% to 1 mass% , i.e. having limitations (a)-(c), achieves the significantly excellent effect of improving synchronization performance in comparison with other friction materials having no limitations (a)-(c).

In Experiment 2, the effect of calcined petroleum coke particle diameter on synchronization performance and abrasion resistance was studied. The results of Experiment 2 are shown in Table 2 enclosed (Appendix D), which is the same as Table 2 of the Rule 1.132 Declaration.

As shown in Table 2, the average coefficient of dynamic friction of Sample 6 (inventive product) is higher than that of Sample 7 (comparative product). Further, the abrasion state of Sample 6 (inventive product) is superior to that of Sample 8 (comparative product).

It is clear from these results that a friction material comprising a calcined petroleum coke wherein not less than 50 mass% of the particles of the calcined petroleum coke have a particle diameter of 0.1 to 0.5 mm, i.e. having limitation (d), achieves the excellent synchronization performance and abrasion resistance in comparison with other friction materials having no limitation (d).

In conclusion, a synchronizer ring comprising the friction material of amended claim 1 achieves a significantly excellent effect of improving synchronization performance by specifically combining limitations (a)-(d). This significantly excellent effect is unexpected and unobvious from Seitz et al. to those skilled in the art.

For the foregoing reasons, the invention of amended claim 1 is unobvious from Seitz et al. to those skilled in the art.

Since claims 6-10 are dependent upon claim 1, the invention of claims 6-10 are unobvious from Seitz et al. as well.

As mentioned above, claims 11 and 12 further have the following limitations:

(e) 10 mass% to 30 mass% of a thermosetting resin;

(f) 5 mass% to 40 mass% of inorganic fibers and/or inorganic particles; and

(g) not more than 5 mass% of graphite,

in addition to amended claim 1.

Limitations (a)-(g) of claims 11 and 12 cannot be conceived from Seitz et al. Further, the specific combination of limitations (a)-(g) of claims 11 and 12 is neither disclosed nor suggested in Seitz et al. Thus, limitations (a)-(g) and the specific combination thereof are unobvious from Seitz et al. to those skilled in the art.

Further, as shown in Tables 1 and 2, the friction material falling within the scope of claims 11 and 12 achieves a significantly excellent effect of improving a synchronization performance in comparison with other friction materials falling outside of the scope of claims 11 and 12. This significantly excellent effect is unexpected and unobvious from Seitz et al. to those skilled in the art.

For the foregoing reasons, the invention of claims 11 and 12 is unobvious from Seitz et al. to those skilled in the art.

In view of the foregoing, favorable reconsideration and allowance is solicited.

Favorable action on the merits is solicited.

Respectfully submitted,

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July 21, 2008

Appendix B

Comparison of the present invention with the cited reference

The present invention **Priority date: Jun. 6, 2003**	**D1: Seitz et al. (US 6,524,681 B1)** **U.S. Filing date: Oct. 2, 1998**
A friction material for a synchronizer ring,	**The friction material** of the present invention also **is usable in synchronizer rings** in manual transmissions (col.5, lines 50-52)
comprising: 30 mass% to 80 mass% of	**the weight ratio of carbon particles/binder** ranges from **about one (1) to 5 parts carbon particles to one (1) part binder**, with the preferred range being **about 1.3 to 2 to one (1) part binder** (col.13, lines 16-19)
a calcined petroleum coke	**No mention**
	the friction material includes friction particles selected from the group of **an organic material**, ---, more preferably, **the friction particles comprise an organic material**, even more preferably, **the organic material comprises coke**, wherein **the coke** is selected from the group of metallurgical coke, **petroleum coke**, coconut shell activated carbon, and mixtures thereof (col.3, lines 5-12)
with an ash content of 0.1 mass% to 1 mass%, based on the whole friction materials for a synchronizer ring,	**No mention**
	the petroleum coke particles generally **contain less than about 5% by weight of inorganic materials other than carbon,** such as sulfur and heavy metals such as nickel and vanadium (col.12, last line - col.13, line 3)
wherein not less than 50 mass% of the particles of the calcined petroleum coke has a diameter of 0.1 to 0.5 mm.	**No mention**
	The friction particles can be in the form of non-randomly or randomly shaped individual particles, ---. The size of said randomly shaped individual particles may range **from about 0.1 micrometer to about 1000 micrometers** (col.12, lines 10-17); Preferably, the friction particles consist essentially of **carbon particles having an average particle size ranging from about 20 micrometers to about 50 micrometers** (col.12, lines 56-59)

Appendix C

Table 1 Material content of Samples 1-5 & Result of synchronization unit performance test

		Material content (mass%)						Average coefficient of dynamic friction (after 300 cycles of lapping)*2
		Calcined petroleum coke	Pitch coke	Raw petroleum coke	Artificial graphite	Novolac type phenolic resin (thermo-setting resin)	Wollastonite fiber*1 (inorganic fiber)	
		Ash content of 0.15 mass%	Ash content of 1.6 mass%	Ash content of 10 mass%	Ash content of 0.5 mass%			
		Particle diameter of 0.1 to 0.5 mm	←	←	←			
Inventive product	Sample 1	65	-	-	-	15	20	0.131
Comparative product	Sample 2	-	65	-	-	15	20	0.125 (-0.006)
	Sample 3	-	-	65	-	15	20	0.117 (-0.014)
	Sample 4	-	-	-	65	15	20	0.119 (-0.012)
	Sample 5	Conventional brass synchronizer ring						0.113 (-0.018)

Note:
*1 Wollastonite fiber has an average fiber diameter of 8 μm.
*2 Numerical values in parenthesis designate difference from Sample 1

Appendix D

Table 2 Material content of Samples 6-8 & Result of synchronization unit performance test

		Material content (mass%)						Average coefficient of dynamic friction (after 500 cycles of lapping)	Abrasion state of friction material
		Calcined petroleum coke			Novolac type phenolic resin (thermo-setting resin)	Glass fiber*1 (inorganic fiber)	Artificial graphite*2 (graphite)		
		Ash content of 0.15 mass%							
		Particle diameter							
		0.1 to 0.5 mm	Less than 0.1 mm	More than 0.5 to 1 mm					
Inventive product	Sample 6	50	-	-	15	30	5	0.135	None
Comparative product	Sample 7	-	50	-	15	30	5	0.131	Almost none
	Sample 8	-	-	50	15	30	5	0.136	Partial chip occurred

Note:
*1 Glass fiber has an average fiber length of 74 μm and an average fiber diameter of 8 μm.
*2 Artificial graphite has an average particle diameter of 250 μm.